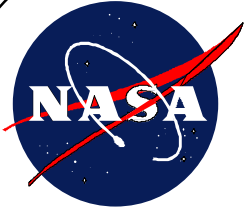


University Earth Systems Science (UnESS) PI Mission Management

University of Maryland

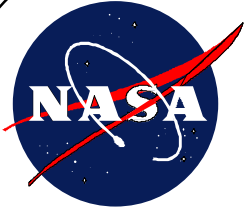
April 27, 2000



Outline



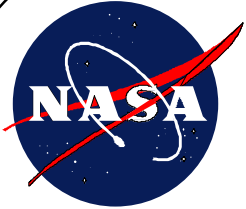
- ☐ PI Mode Roles and Responsibilities
- ☐ PI Mode Strategies
- ☐ PI Mode Reviews
- ☐ PI Mode Lessons Learned
- ☐ Websites



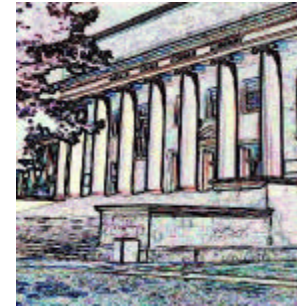
UnESS PI Mode Roles and Responsibilities



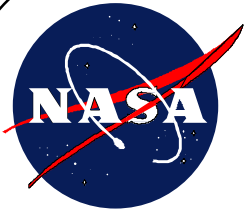
- ☐ The Principal Investigator (PI) is responsible for the overall success of the Project and is accountable to the AA/OES for the scientific success and to the Center Director for the programmatic success and safety.
- ☐ The GSFC Program Management Council (PMC) is the governing PMC for the UnESS Project.
- ☐ The GSFC Center Director is responsible for recommending confirmation and certifying flight readiness to the Associate Administrator.
- ☐ GSFC is responsible for ensuring the PI takes the appropriate actions to achieve mission success within his/her committed cost, schedule, and safety reliability & quality assurance requirements.



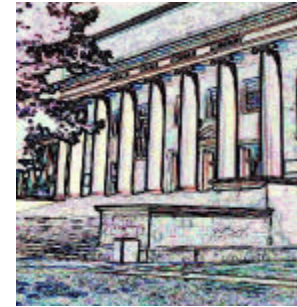
UnESS PI Mode Roles and Responsibilities (cont'd):



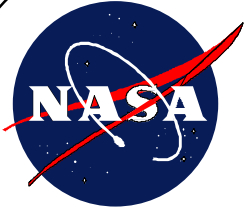
- ☐ The NASA Project Manager is the COTR and a member of the PI's project team.
- ☐ NASA system engineering participates as part of reviews and with the PI's engineering team, as requested.
- ☐ Ad hoc NASA discipline engineering supports the NASA Project Manager and PI, as requested, with technical insight and troubleshooting.
- ☐ NASA Project Manager recommends courses of action and helps obtain government resources when requested.
- ☐ NASA resource and business staff help maintain insight and provide recommendations through contract analysis and personal contacts.
- ☐ The Program provides insight to NASA management through monthly reviews, weekly reporting, timely notification of problems/resolution plans, and involvement in special reviews.



PI Mode Strategies



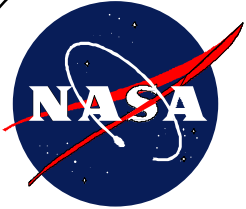
- ☐ Cost Capped Missions - Total mission life cycle costs are capped. PI is free to move \$ across major elements and mission phases. Missions are constrained only by science requirements and assurance of a launch vehicle. If at any time a mission is projected to exceed its cost cap, the PI is expected to execute descope options or to recommend cancellation. NASA will hold a program review and decide if a cancellation review should be held.
- ☐ Minimum Science Mission and Descope Plan - PI defines and NASA concurs on the minimum acceptable science mission that is worth the investment. PI defines descope plan that will be exercised if funds or schedule prove inadequate to solve development problems. This is the ultimate mission margin.



PI Mode Reviews



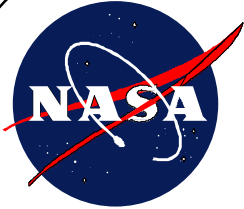
- ☐ The PI is responsible for Peer Reviews and to provide the results to the System Level Reviews.
- ☐ GSFC is responsible for System Level Reviews and will assist in peer reviews as requested.
- ☐ The PI is required to staff the Peer Reviews with independent, experienced, experts from outside the PI Team as well as Team members.
- ☐ Hold lots of peer reviews with outside folks, document these, along with action items, and how they were resolved.



PI Mode Lessons Learned



- ☐ During concept study period, address and correct weaknesses identified during TMCO evaluation. Utilize this time effectively by allocating resources to mitigate technical (prototype development and test) and programmatic risks.
- ☐ Work within established guidelines, as changes cost money.
- ☐ Develop complete Risk Management Process.
 - ☐ Do FMECA/Fault Tree Analysis early on
 - ☐ Identify Issues and Design the system within cost constraints.
 - ☐ Make good trade offs.
 - ☐ Develop redundancy where it makes the most sense given the budget and the design issues.
- ☐ Develop and maintain good margins.



PI Mode Lessons Learned



- ☐ **Every PI Mission is unique. Factors which vary from mission to mission include:**

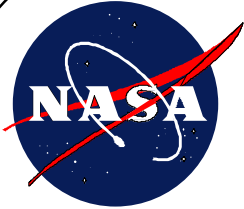
Complexity of mission and problems encountered

Experience base of PI Team

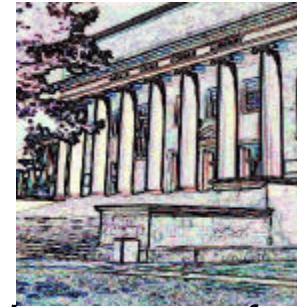
Project Management skills of PI

Receptiveness to NASA involvement

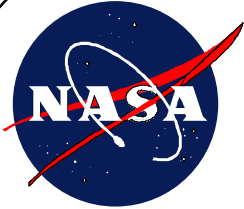
- ☐ Evaluate the ability of your team to successfully implement the mission and mitigate risks.
- ☐ Review Hardware Technology Readiness Levels. Technology readiness is extremely important, technology development does not lend itself to smaller, faster, cost capped missions, even “slight” technology advances always cost more than anticipated.
- ☐ NASA and the PI need to define, develop, negotiate and document mission management roles and responsibilities as well as any NASA technical and programmatic support needed by the mission prior to contract award.



Lessons Learned Summary



- The quality and experience of the team members is an important factor for mission success
 - System Engineering and a rigorous, well-defined system engineering process are critical to successful mission planning and development
 - NASA can augment these resources to support the missions
 - 36 - 48 Months is a SHORT TIME and \$ are very constrained; thus Technology Readiness is extremely important
 - Clear Roles, Responsibilities and Lines of Authority are Critical
 - Well defined science and mission requirements are a MUST
 - Smaller, Faster, Less Expensive Missions Must Better Understand and Proactively Manage Risk
 - Independent Peer Reviews and NASA System Level Review Process are **essential**
 - Extremely important to develop a good working relationship with the PI and his team & teamwork between all project organizations is crucial
- “Better is the enemy of good enough”



For More information:



UnESS related Webpages:

☐ The UnESS Project Page:

<http://www.wff.nasa.gov/~code850/pages/uness.html>

☐ The UnESS Project Library

<http://uness.larc.nasa.gov/uness/unesslib.html>

☐ The Earth Explorers Page:

<http://earthexplorers.gsfc.nasa.gov/index.html>

☐ The Earth Explorers Library Page:

<http://earthexplorers.gsfc.nasa.gov/library.html>